WHAT IS CLAIMED IS:

1. A semiconductor device comprising a first vertical type bipolar transistor and a second vertical type bipolar transistor whose voltage is different from that of said first vertical type bipolar transistor formed on a semiconductor substrate made by forming an epitaxial layer on a silicon substrate, wherein said first vertical type bipolar transistor has a first embedded diffusion layer formed in an upper part of said silicon substrate and of the same conductive type as said epitaxial layer and having an impurity concentration higher than that of said epitaxial layer, said second vertical type bipolar transistor has a second embedded diffusion layer formed in an upper part of said silicon substrate and of the same conductive type as said epitaxial layer, and the impurity concentration of said second embedded diffusion layer is different from the impurity concentration of said first embedded diffusion layer.

2. A semiconductor device according to claim 1, wherein a further embedded diffusion layer for taking out a collector of said second vertical type bipolar transistor connecting with a collector leading diffusion layer formed in said epitaxial layer and with said second embedded diffusion layer and having an impurity concentration higher than the impurity concentration of said second embedded diffusion

layer is formed in said semiconductor substrate.

3. A semiconductor device according to claim 1, wherein the depth of said first embedded diffusion layer is shallower than the depth of said second embedded diffusion layer.

4. A semiconductor device according to claim 3, wherein the impurity concentration of said second embedded diffusion layer is at least as great as the impurity concentration of said epitaxial layer formed above said second embedded diffusion layer.

5. A semiconductor device according to claim 4, wherein the impurity concentration of said second embedded diffusion layer is lower than the impurity concentration of said first embedded diffusion layer.

6. A semiconductor device according to claim 3, wherein the impurity concentration of said second embedded diffusion layer is 1×10^{13} to 1×10^{15}.

7. A semiconductor device comprising a first vertical type bipolar transistor and a second vertical type bipolar transistor whose voltage is different from that of said first vertical type bipolar transistor formed on a semiconductor substrate made by forming an epitaxial layer on a silicon substrate, wherein said first vertical type bipolar transistor has a first embedded diffusion layer formed in an upper part of said silicon substrate and of the same

conductive type as said epitaxial layer and having an impurity concentration higher than that of said epitaxial layer, said second vertical type bipolar transistor has a second embedded diffusion layer formed in an upper part of said silicon substrate and of the same conductive type as said epitaxial layer, and the impurity concentration of said second embedded diffusion layer is lower than the impurity concentration of said first embedded diffusion layer and the depth of said second embedded diffusion layer is deeper than the depth of said first embedded diffusion layer.

8. A semiconductor device according to claim 7, wherein a further embedded diffusion layer for taking out a collector of said second vertical type bipolar transistor connecting with a collector leading diffusion layer formed in said epitaxial layer and with said second embedded diffusion layer and having an impurity concentration higher than the impurity concentration of said second embedded diffusion layer is formed in said semiconductor substrate.

9. A semiconductor device comprising a first vertical type bipolar transistor, a second vertical type bipolar transistor whose voltage is different from that of said first vertical type bipolar transistor and a third vertical type bipolar transistor having the opposite polarity to the polarity of said second vertical type bipolar transistor formed on a semiconductor substrate made by forming an

epitaxial layer on a silicon substrate, wherein said first vertical type bipolar transistor has a first embedded diffusion layer formed in an upper part of said silicon substrate and of the same conductive type as said epitaxial layer and having an impurity concentration higher than that of said epitaxial layer, said second vertical type bipolar transistor has a second embedded diffusion layer formed in an upper part of said silicon substrate and of the same conductive type as said epitaxial layer and having an impurity concentration lower than the impurity concentration of said first embedded diffusion layer and having a depth deeper than the depth of said first embedded diffusion layer, and said third vertical type bipolar transistor has a separating diffusion layer formed in an upper part of said silicon substrate for separating from said silicon substrate a third embedded diffusion layer of the opposite conductive type to said epitaxial layer.

10. A semiconductor device according to claim 9, wherein a further embedded diffusion layer for taking out a collector of said second vertical type bipolar transistor connecting with a collector leading diffusion layer formed in said epitaxial layer and with said second embedded diffusion layer and having an impurity concentration higher than the impurity concentration of said second embedded diffusion layer is formed in said semiconductor substrate.

11. A semiconductor device manufacturing method for forming a first vertical type bipolar transistor and a second vertical type bipolar transistor whose voltage is different from that of said first vertical type bipolar transistor on a semiconductor substrate made by forming an epitaxial layer on a silicon substrate, comprising the steps of, before said epitaxial layer is formed on said silicon substrate:

forming in an upper part of said silicon substrate in a region where said first vertical type bipolar transistor is to be formed a first embedded diffusion layer of the same conductive type as said epitaxial layer and having an impurity concentration higher than the impurity concentration of said epitaxial layer; and

forming in an upper part of said silicon substrate in a region where said second vertical type bipolar transistor is to be formed a second embedded diffusion layer of the same conductive type as said epitaxial layer and having an impurity concentration lower than the impurity concentration of said first embedded diffusion layer and having a depth deeper than the depth of said first embedded diffusion layer.

12. A semiconductor device manufacturing method for forming a first vertical type bipolar transistor, a second vertical type bipolar transistor whose voltage is different from that of said first vertical type bipolar transistor and a third vertical type bipolar transistor having the opposite

polarity to the polarity of said second vertical type bipolar transistor on a semiconductor substrate made by forming an epitaxial layer on a silicon substrate, comprising the steps of, before said epitaxial layer is formed on said silicon substrate:

forming in an upper part of said silicon substrate in a region where said second vertical type bipolar transistor is to be formed a second embedded diffusion layer of the same conductive type as said epitaxial layer and having an impurity concentration lower than the impurity concentration of a first embedded diffusion layer formed in a region where said first vertical type bipolar transistor is to be formed and having a depth deeper than the depth of said first embedded diffusion layer; and simultaneously

forming in an upper part of said silicon substrate in a region where said third vertical type bipolar transistor is to be formed a separating diffusion layer for separating from said silicon substrate a third embedded diffusion layer of the opposite conductive type to said epitaxial layer.

13. A semiconductor device manufacturing method according to claim 11, further comprising the step of, before said epitaxial layer is formed on said silicon substrate, forming in said semiconductor substrate a further embedded diffusion layer for taking out a collector of said second vertical type bipolar transistor connecting with a collector

leading diffusion layer formed in said epitaxial layer and with said second embedded diffusion layer and having an impurity concentration higher than the impurity concentration of said second embedded diffusion layer.

14. A semiconductor device manufacturing method according to claim 13, wherein said first embedded diffusion layer and said further embedded diffusion layer are formed in the same step.

15. A semiconductor device manufacturing method according to claim 12, further comprising the step of, before said epitaxial layer is formed on said silicon substrate, forming in said semiconductor substrate a further embedded diffusion layer for taking out a collector of said second vertical type bipolar transistor connecting with a collector leading diffusion layer formed in said epitaxial layer and with said second embedded diffusion layer and having an impurity concentration higher than the impurity concentration of said second embedded diffusion layer.

16. A semiconductor device manufacturing method according to claim 15, wherein said first embedded diffusion layer and said further embedded diffusion layer are formed in the same step.

add B3 add G7 add G8 add H6 add J5